The journey to change minerals exploration using ultrafine soils and data analytics

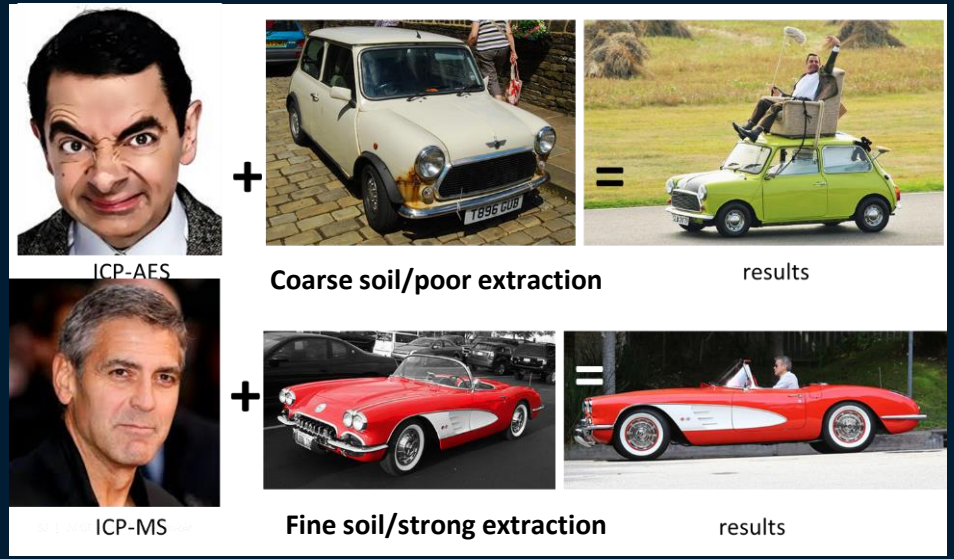
Ryan Noble (on behalf of many)

The issue

The origin

The origin

The need



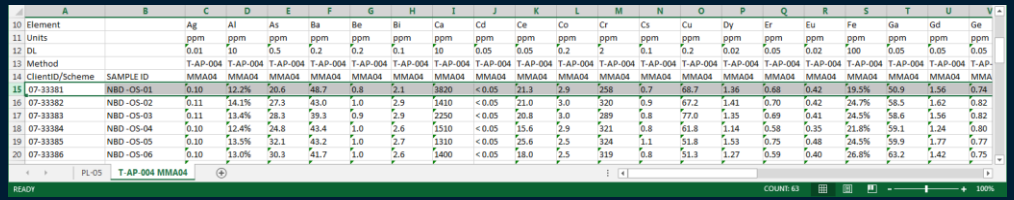
Modified from Nick Oliver, HCOV Consulting

The reality

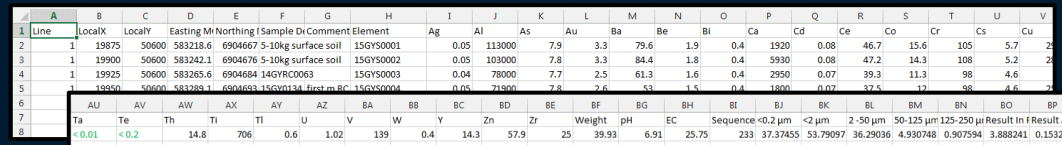
Modified from Nick Oliver, HCOV Consulting

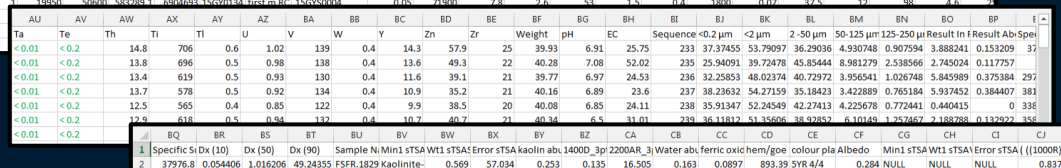
The solution

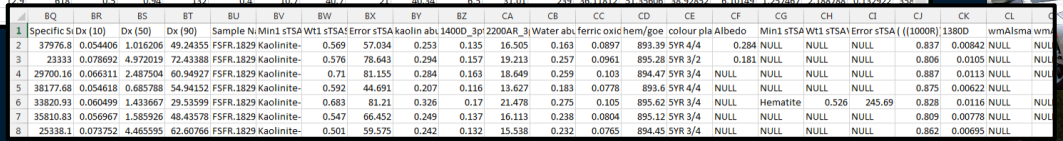
- Current “best” offering for commercial laboratories

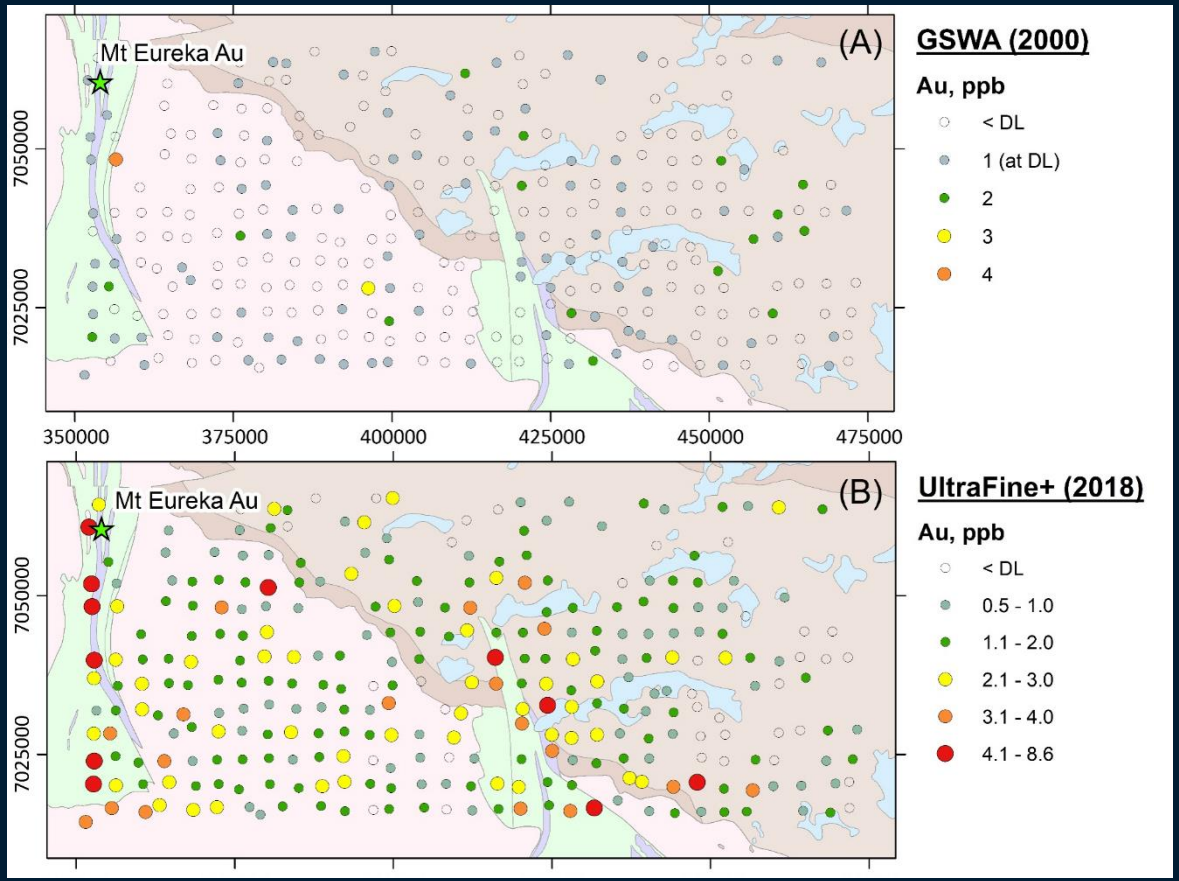


- UltraFine+ workflow








Mt Eureka Au
(A)
GSWA (2000)
Au, ppb
< DL
1 (at DL)
2
3
4
7050000
7025000
350000
375000
400000
425000
450000
475000
Mt Eureka Au
(B)
UltraFine+ (2018)
Au, ppb
< DL
0.5 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 8.6
7050000
7025000

The outcome

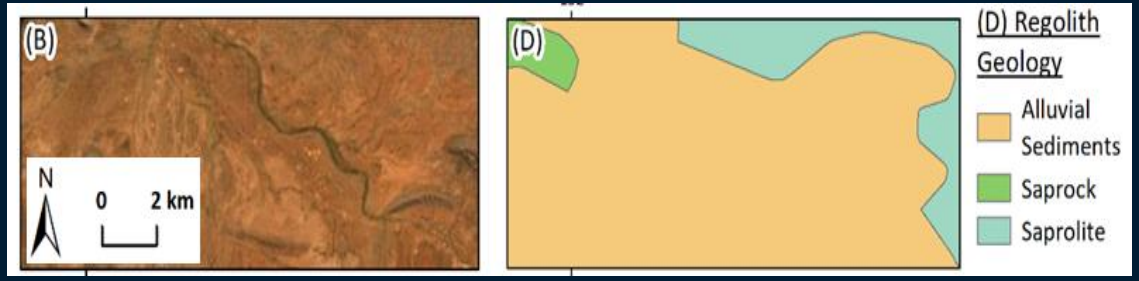
- End of M462
  - ~3000 samples
  - ↑ 250% Au and pathfinder elements, ↓ bdl especially for Au, added Pd and Pt
  - Au focus (with a little Cu Zn test work)
  - Proof of concept and commercial viability
  - Translation to commercialised lab and trademark

- M462a?...
  - Now how can we improve the interpretation (for SMEs)?
    - Geochemistry and landscape knowledge
  - Challenge was funding to be bigger and bolder – SMEs can't do this even collectively

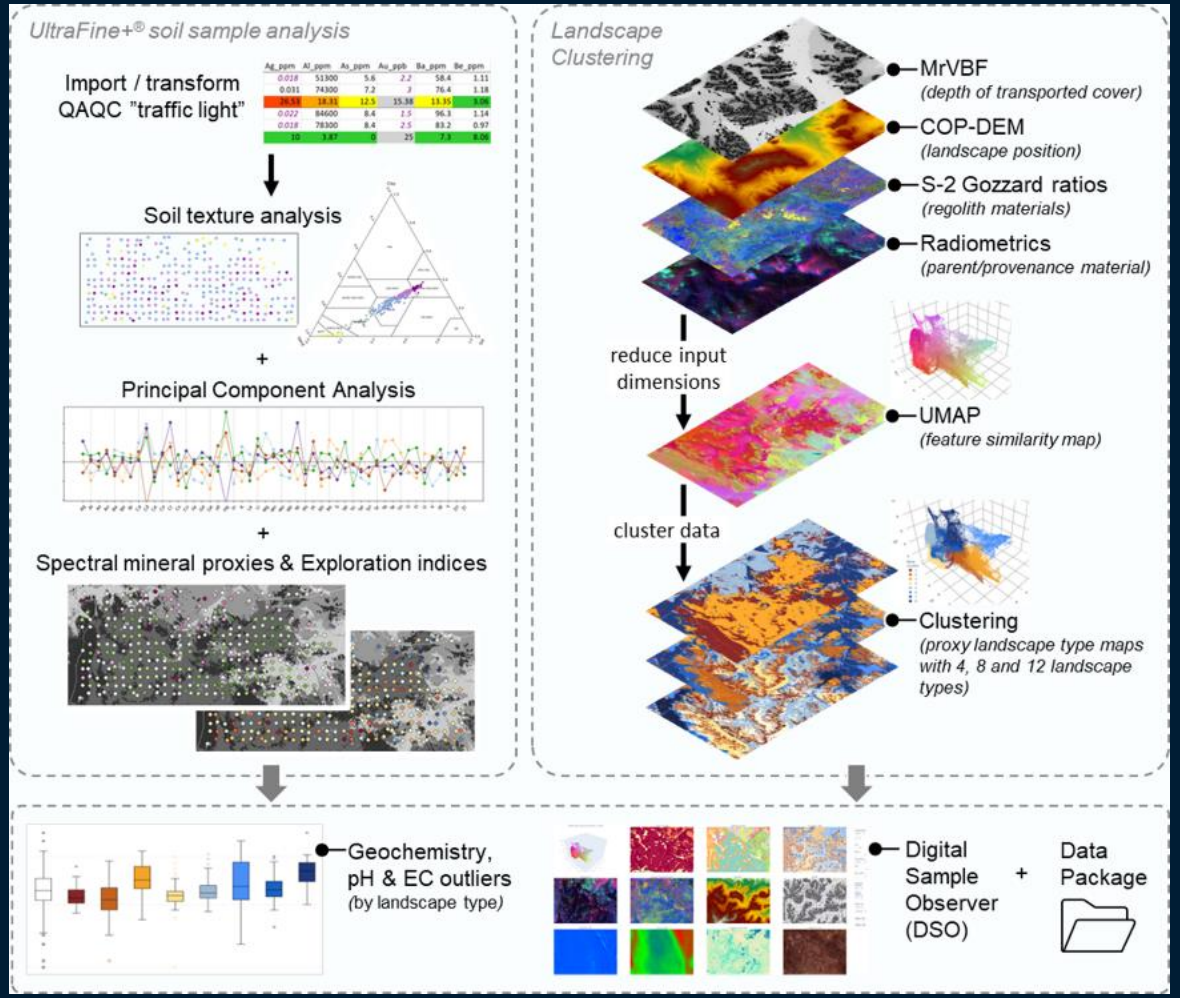
The gap year and next phase

- M462a?... How can we improve the interpretation (for SMEs)?
  - Geochemistry and landscape knowledge
  - Funding challenge to be bigger and bolder – SMEs can’t do this

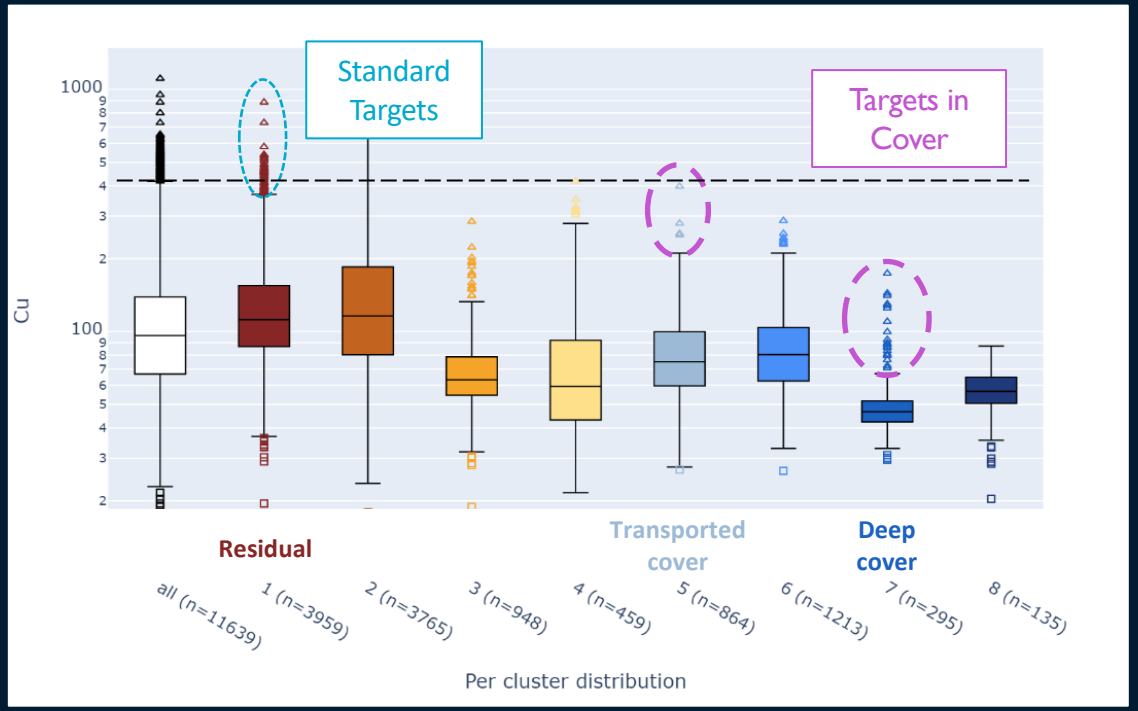
The reality


(B)
N
0
2 km
(D)
(D) Regolith Geology
Alluvial Sediments
Saprock
Saprolite
(B)
N
0
1.5 km
(D)
-23.4
(D) Regolith Geology
Aeolian Sediments
Saprock

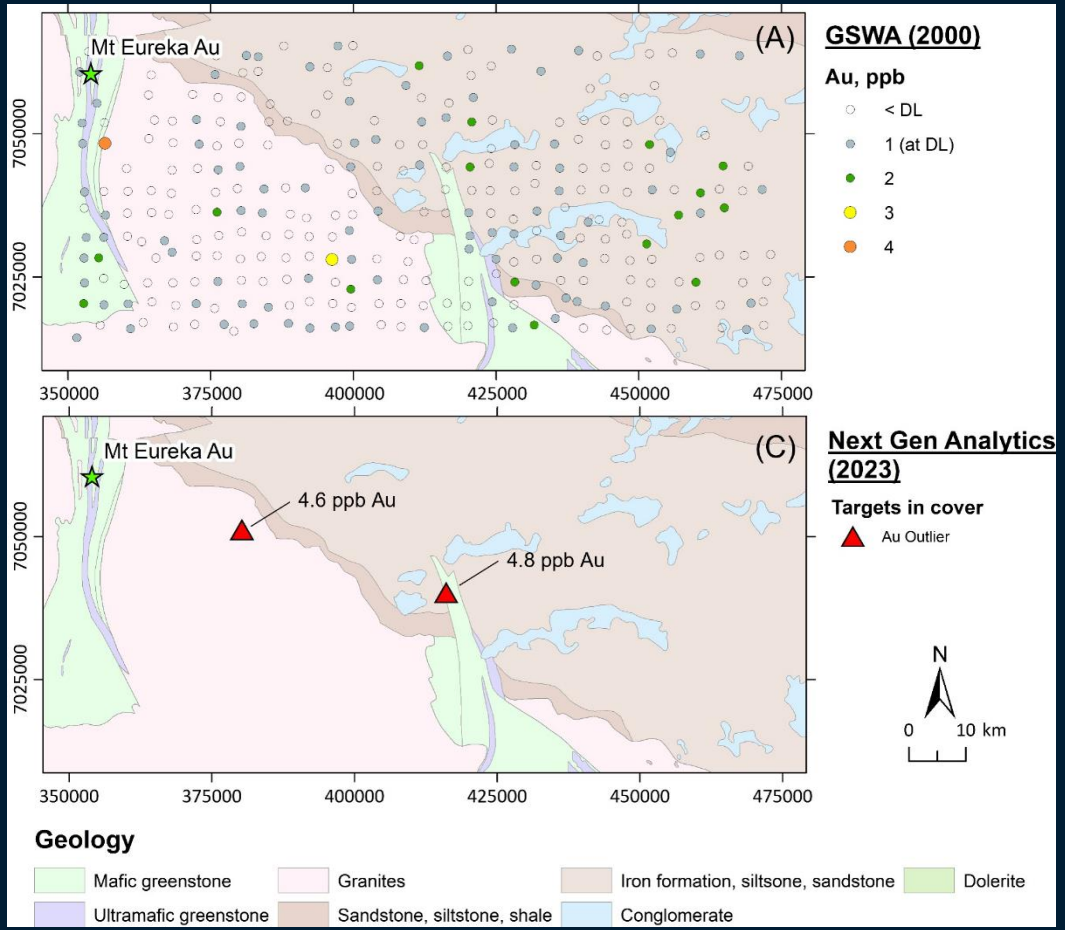
The solution



The outcome

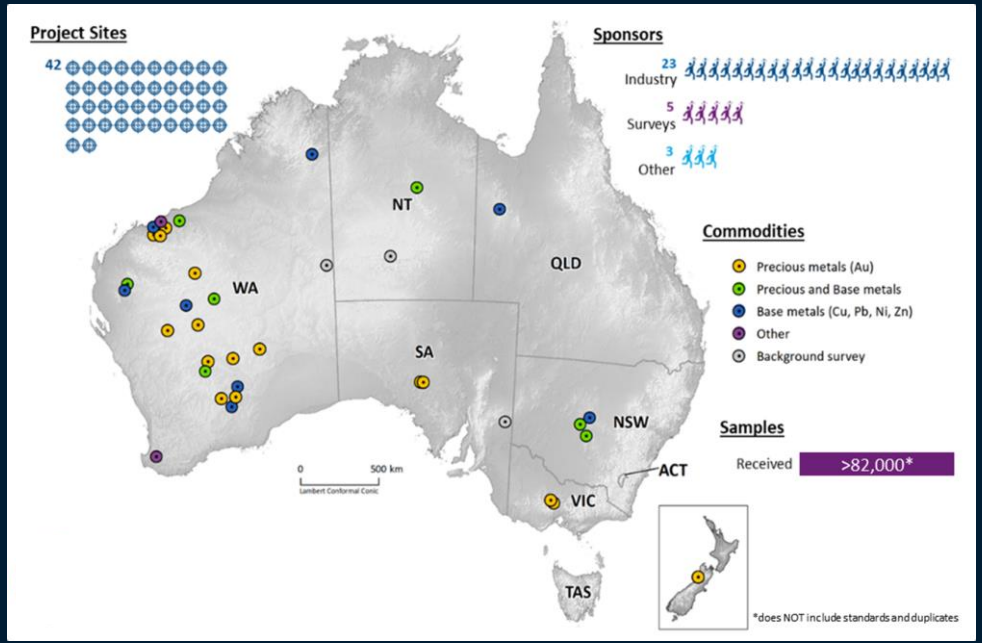

Standard Targets
Targets in Cover
Cu
1000
100
Residual
Transported cover
Deep cover
all (n=11639)
1 (n=3959)
2 (n=3765)
3 (n=948)
4 (n=459)
5 (n=864)
6 (n=1213)
7 (n=295)
8 (n=135)
Per cluster distribution

+ PCA, exploration indices, regolith ratios, spectral parameters
+New targets, new interest, new commodities



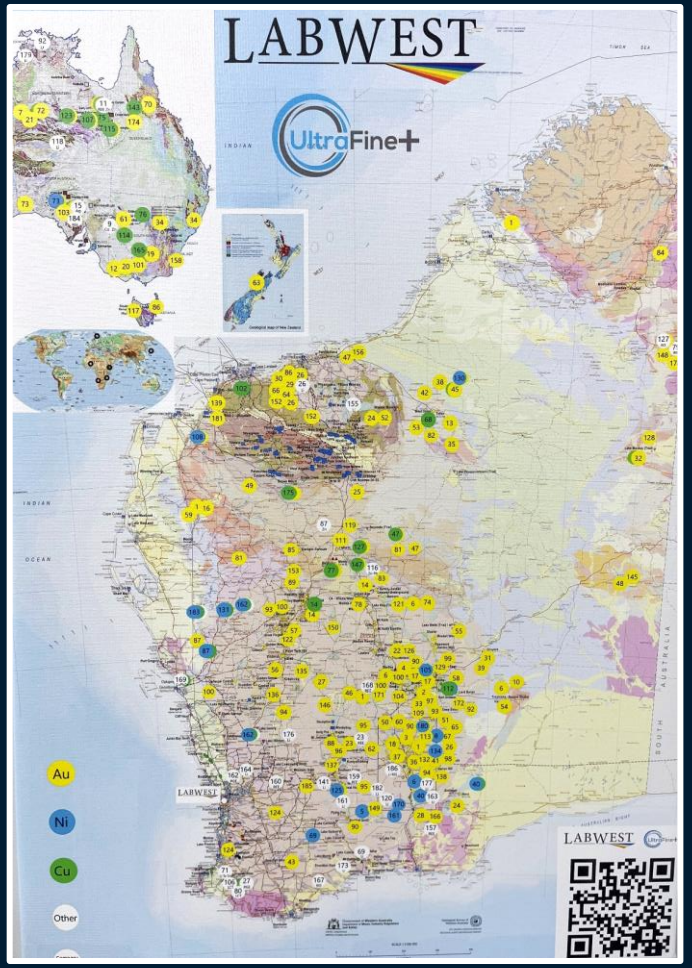
The outcomes

- End of M462a
  - Viable for nearly all critical metals in cover (tested Li, REE, PGE)
  - Next Gen Analytics data package
  - SME uptake

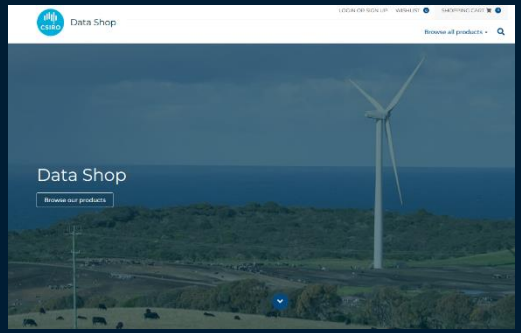


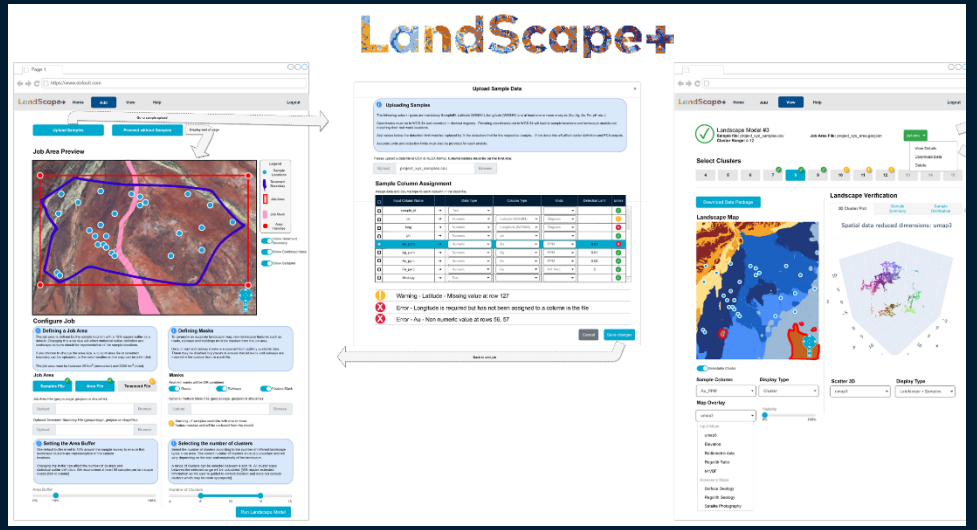
The outcomes

- LabWest ~2000 samples A WEEK
- LabWest staff expanded from 6 to 45



The future





- M462b? Probably not now, but will reload for a new challenge

The supporters

Australia's National Science Agency

The UltraFine+® CSRIO Team

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